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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CLEVELAND, MICHAEL B	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/606,460	JOSHI ET AL.	
	Examiner	Art Unit	
	Michael Cleveland	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *28-45 and 50-72* is/are pending in the application.

4a) Of the above claim(s) *53 and 64* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *28-45, 50-52, 54-63, 65-72* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 53 and 64 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 1/4/2005. Note: Applicant lists claims 55 and 66 as "Withdrawn", but they read on the elected species, and therefore they have been considered in the present action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 28, 32, 36, 50-52, 54, 57-63, 65, and 68-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eckles (U.S. Patent 5,405,523, hereafter '523) and Suzuki et al. (U.S. Patent 4,888,218, hereafter '218) in view of each other.

'523 teaches a method for depositing a zinc alloy protective coating on metal substrates which comprises

A) immersing a metal substrate in an aqueous acidic immersion plating solution having a pH of from about 3.5 to 6.2 (col. 2, lines 42-45) and comprising zinc ions (col. 2, lines 24-26), nickel and/or cobalt ions (col. 2, lines 26-28), negative ions such as chloride (col. 4, lines 36-44), and at least one inhibitor containing one or more nitrogen and/or sulfur atoms (col. 2, line 46-col. 3, line 8) for a period of time sufficient to deposit the desired coating, and

B) removing the substrate because the substrate must inherently be removed from the bath for use.

The solution is free of cyanide ions and aliphatic amines and hydroxylamines.

'523 does not explicitly teach that the substrate is aluminum nor that the solution contains fluoride ions.

'218 teaches a method for depositing a zinc alloy protective coating on aluminum substrates which comprises

A) immersing an aluminum substrate in an aqueous acidic immersion plating solution having a pH of from about 4 to 6 (Abstract) and comprising zinc ions and fluoride ions (col. 5, lines 36-51) for a period of time sufficient to deposit the desired coating, and

B) removing the substrate because the substrate must inherently be removed from the bath for use.

The solution is free of cyanide ions and aliphatic amines and hydroxylamines.

'218 does not explicitly teach the use of nickel and/or cobalt ions nor the use of a nitrogen and/or sulfur containing inhibitor.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the process of '523 to have coated an aluminum substrate with the zinc electrolytic coating because '218 teaches that aluminum substrates benefit from such coatings and to have used fluoride instead of chloride as the negative ion with a reasonable expectation of success and with the expectation of similar results because '218 recognizes that fluoride is a

suitable negative ion in zinc electrolytic plating baths. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Similarly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used nickel and/or copper ions of '523 in the zinc plating bath of '218 because '523 teaches that they are suitable alloying ions, especially in view of Applicant's admission on p. 2 that nickel, copper, or iron in a zincating bath improve adhesion of the zinc coating. Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the nitrogen- and/or sulfur-containing brightening agent of '523 in order to have brightened the coating.

Claims 32, 36, 57-58, 60: '523 teaches approximately 4-50 g/l of zinc ions (col. 4, lines 47-51), 0.02-20 of the alloying ions, such as nickel and/or cobalt (col. 4, lines 53-68), and about 0.05-2 g/l of the nitrogen-containing compound (col. 4, lines 3-8). '218 teaches 16.2 g/l of ZnF_2 per liter (col. 4, lines 50-55), which yields about 6 g/L of fluoride ions.

Claims 50, 61-62, 71: The solution may contain acetate (one of Applicant's particularly claimed complexing agents) (col. 4, lines 36-38).

Claims 51, 69: The solution may contain iron ions (col. 2, lines 24-28).

Claims 52, 54, 63, 65: The brightener may be a nitrogen-containing heterocyclic compound (col. 2, lines 60-65).

Claims 59, 70: The solutions in both references are free of aliphatic amines and hydroxylamines.

6. Claims 29-31, 33-35, 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eckles '523 and Suzuki '218 in view of each other as applied to claim 28, 32, and 36 above, and further in view of Haydu et al. (U.S. Patent 5,182,006, hereafter '006).

'523 and '218 are described above, but do not explicitly teach cleaning, etching, and de-smutting before immersion in the electroplating bath. However, '218 does teach that conventional cleaning and degreasing techniques may be applied to the aluminum substrate (col. 3, lines 11-15).

'006 teaches that it is conventional to prepare aluminum substrates for zinc electroplating treatments by cleaning, etching, and de-smutting the substrate prior to forming the zinc coating (col. 2, lines 4-19), followed by rinsing after each step (col. 6, lines 31-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have cleaned, etched, and de-smutted the substrate prior to forming the zinc coating of '523 and '218 with a reasonable expectation of success because '218 teaches that conventional cleaning procedures may be used and '006 teaches that cleaning, etching, and de-smutting the substrate prior to forming the zinc coating is a suitable cleaning procedure to prepare aluminum substrates for zinc coatings. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Claims 30, 34, 38: The cleaning may be performed with an alkaline cleaner (col. 4, lines 4-10), etching may be performed with an acidic etchant (col. 4, lines 11-19).

Claims 31, 35, 39: The cleaning, etching, de-smutting, and plating processes may each be followed by rinsing steps (col. 6, lines 31-55). It is well-known in this art to water-rinse between treatment baths so that cross-contamination does not occur between the various dip tanks.

7. Claims 40 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eckles '523 and Suzuki '218 in view of each other as applied to claim 28 and 32 above, and further in view of GB Patent 1,263,351, hereafter '351.

'523 and '218 are described above, but do not explicitly teach plating the zinc alloy-coated substrate with an electroless or electrolytic plating solution. However, '351 teaches the use of zinc alloy coatings before further metal plating by electrolytic deposition (p. 1, lines 10-39).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the invention of '523 and '218 to prepare an aluminum substrate for further electrolytic deposition with a reasonable expectation of success because

'351 teaches that further electrolytic plating is a suitable use for zinc coated aluminum substrates.

8. Claims 41-42 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eckles '523 and Suzuki '218 in view of each other and further in view of GB '351 as applied to claim 40 and 43 above, and further in view of Haydu '006 for substantially the same reasons given for claims 29-31 above.

9. Claims 55-56, 66-67, and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eckles '523 and Suzuki '218 in view of each other as applied to claim 28, 32, and 36 above, and further in view of McCoy (U.S. Patent 4,356,067, hereafter '067).

'523 and '218 are described above, but do not explicitly teach plating the use of a mercapto-substituted nitrogen-containing heterocyclic compound. However, '523 teaches the use of other conventional brighteners (p. 1, lines 10-39). '067 teaches the use of 2-mercaptobenzimidazole as a brightener in zinc plating solution (Abstract, col. 7, lines 12-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included 2-mercaptobenzimidazole in the solution of '523 and '218 with a reasonable expectation of success because '523 is open to the use of other conventional brighteners and '067 teaches that 2-mercaptobenzimidazole is a suitable brightener for zinc plating solutions.

Claim 66-67: The conventional brightener of '067 may be used in an amount of 0.01-0.25 g/L (col. 7, lines 22-25).

10. Claims 32-35, 43-45, 68, 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wernick et al. (NPL cited by Applicant).

Wernick teaches depositing a zinc alloy coating on an aluminum substrate by immersing the aluminum in an aqueous acidic plating solution for a time inherently sufficient to deposit a desired coating before removal. Wernick's teaches immersion in a solution of zinc and nickel ions or zinc and fluoride ions. However, it has long been held that "It is prima facie obvious to

combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re *Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a single composition comprising zinc, nickel and fluoride ions with a reasonable expectation of success because Wernick teaches that solutions with the ions are separately capable of providing zinc plating solutions. Additionally, Wernick does not teach the use of cyanide, nor aliphatic amines or hydroxylamines; therefore it is Examiner's position that none are present, as required. The only composition limitation not specifically taught by Wernick is the pH of 3.5-6.5. Wernick instead teaches a pH of 3. However, Wernick teaches a similar acidic pH and, in the absence of a specific showing of criticality, it is Examiner's position that selection of cause-effective variable, such as an appropriate pH, would have been obvious for selection by an ordinary artisan depending on the desired plating properties of the solution. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). Furthermore, "differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical." (MPEP 2144.05.II.A.)

Regarding claims 32, requiring specific concentrations of the zincate bath, Wernick teaches one exemplary concentration combination of substances, but teaches that the composition is "by no means critical". It is Examiner's position that concentration is a cause-effective variable. Selection of a suitable concentration for use in a zincate bath would have been within the skill of an ordinary artisan, as outlined above. It would have been obvious to one of ordinary skill in the art to optimize concentrations in a zincate bath to achieve the desired zinc alloy coating on the aluminum substrate.

Claims 43: Wernick teaches that the substrate may be immersion plated twice (p. 1052).

Claims 33-35, 44-45: Wernick teaches cleaning, etching, and desmutting, such that the cleaning/desmutting occurs with a solvent cleaner and etching occurs with an alkaline cleaner, between each of which Examiner notes that it would have been obvious to use a water rinse. It is

well-known in this art to water-rinse between treatment baths so that cross-contamination does not occur between the various dip tanks.

11. Claims 32-35, 43-45, and 68-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki '218 in view of either Zelley (U.S. Patent 2,676,916, hereafter '916) or the Applicant's admitted state of the prior art.

Suzuki teaches a process for depositing a zinc alloy coating on an aluminum substrate by immersing the substrate in an aqueous immersion plating solution (abstract; col. 2, line 52), inherently for a time sufficient to deposit the desired coating before removing. The solution of Suzuki is at a pH of 4-6, overlapping the range claimed by Applicant, and contains the zinc and fluoride ions required. No cyanide nor aliphatic amines or hydroxylamines appear to be present in the coating of Suzuki.

What Suzuki fails to specifically teach is the inclusion of nickel or cobalt ions. However, on p. 2 of Applicant's instant specification, Applicant states that it is known in the art to use nickel, copper, or iron in a zincating bath to improve adhesion of the zinc coating. Likewise, Zelley teaches that the use of cobalt or nickel in zinc baths forms a uniform, dense, adherent coating on the surface of plated aluminum substrates.

Since Suzuki teaches depositing zinc alloys onto aluminum substrates by zinc bath and Zelley and Applicant's admitted state of the prior art teach that inclusion of nickel or cobalt in zinc baths for plating aluminum substrates enhances adhesion of the deposit, Zelley or the admitted state of the art would have reasonably suggested the use of nickel or cobalt in the zinc bath of Suzuki. It would have been obvious to one of ordinary skill in the art to use the teachings of Zelley or the admitted prior art in the method of Suzuki to provide Suzuki with a more dense, uniform, adherent coating of zinc alloy.

Regarding the specific concentrations of the zincate bath, Suzuki teaches 16.2 g/l of zinc fluoride (col. 4, line 54), (approx 10.2 g Zn ions and 6 g F ions), within the ranges required for each of these ions. While Suzuki in view of Zelley or the admitted prior art does not provide the concentration of nickel and/or cobalt, it is Examiner's position that concentration is a cause-effective variable. Selection of a suitable concentration for use in a zincate bath would have been within the skill of an ordinary artisan, as outlined above. It would have been obvious to one

of ordinary skill in the art to optimize concentrations of nickel or cobalt in a zincate bath to achieve the desired zinc alloy coating on the aluminum substrate. Zelley's nickel salt would act as Applicant's nickel-containing inhibitor, with concentration being optimizable for those reasons above. "[D]ifferences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical." (MPEP 2144.05.II.A.)

Claim 43: '916 teaches further electroplating the zinc coating.

Claims 33-35, 44-45: Suzuki teaches cleaning organic contaminants with a solvent cleaner and then etching with a caustic agent (paragraph bridging columns 3-4). Suzuki teaches some rinsing steps, but does not specify that they occur between each process step. However, it is well-known in this art to water-rinse between treatment baths so that cross-contamination does not occur between the various dip tanks. Rinsing steps would have been obvious for those reasons outlined above.

Claim 69: '916 further teaches that iron ions may be added.

Response to Arguments

12. Applicant's arguments filed 3/3/2005 have been fully considered but they are not persuasive.

Applicant states that claims 28-31, 36-42, 50-59, 60-67, 71, and 72 are rejected over the basic combination of Eckles and Suzuki (and other references). The statement is incorrect because the complete list of claims rejected based on Eckles and Suzuki (and other references) is 28-45, 50-52, 54-63, and 65-72. Claims 53 and 64 are withdrawn as drawn to non-elected species.

Applicant argues that Eckles does not teach an immersion plating bath because it teaches an electroplating bath. The argument is unconvincing because it is incorrect. Eckles teaches immersing the substrate in the electroplating bath. Therefore, it clearly meets the limitations of an "immersion plating bath" because it is an immersion bath and a plating bath. Applicant argues that the quaternary ammonium polymer additives are brighteners and would not function as inhibitors. The argument is unconvincing because it is unsupported by evidence. Furthermore, the taught brighteners are within one of Applicant's particularly claimed sub-genuses (claim 54).

Therefore, it must either be capable of functioning as an inhibitor or else the inhibiting function is caused by essential features which are not present in the claims. The Examiner further notes that at least one specific brightener recognized by McCoy is among Applicant's list of exemplary inhibitors at pp. 8-9.

Applicant argues that Suzuki does not teach a zinc alloy. The argument is unconvincing because it is incorrect. See, e.g, col. 2, lines 59-63. Even if the argument were not incorrect, the argument would not address the combinaton of references because Eckles teaches protective zinc coatings applied to metals, and Suzuki teaches that aluminum is a particular metal that benefits from protective zinc coatings.

Applicant argues that the features of the solutions of Eckles and Suzuki are incompatible. The argument is unconvincing because it is unsupported by evidence or concrete scientific arguments. Eckles and Suzuki each teach suitable features of zinc plating baths. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Applicant argues that the teaching of p. 2 is not an admission that copper, nickel, or iron improve adhesion of a zinc coating because the context is limited to that of zincate baths. The argument is unconvincing in the absence of evidence or concrete scientific arguments why the ions would only improve adhesion from a basic bath. The identities of the ions are the same regardless of the pH of the bath. Therefore, ions that improve adhesion from a basic bath would also have been expected to have improved adhesion from an acidic bath.

Applicant's arguments regarding the concentration of Wernick and pH of Zelley are unconvincing because "differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical." (MPEP 2144.05.II.A.) No such evidence has been presented. Applicant's arguments regarding pH are unconvincing for substantially the same reason because pH is a measure of the concentration of hydrogen ions. Applicant's arguments regarding motivation in the response of 10/15/2004 are unconvincing because they do not address the policies recited in MPEP 2144.05.II.A.

Applicant's arguments that Zelley teaches away from using values about 1.5 g/l are unconvincing because the teaching of a tendency to cause blistering is a far cry from the statement of complete inoperability necessary to constitute a teaching away.

Applicant argues that the Zelley teaches the addition of nickel or cobalt in alkaline rather than acidic solution. The argument is unconvincing because Zelley does not teach that the improved adhesion would not be experienced by acidic zincating baths. The teaching of Zelley suggests that the improved adhesion is due to the presence of the nickel or cobalt regardless of the pH of the solution.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Martin et al. (U.S. Patent 4,488,942), Austin et al. (U.S. Patent 4,416,737), Herr (U.S. Patent 4,134,802), Shinomiya et al. (U.S. Patent 3,930,081), and Harbulak (U.S. Patent 3,669,854) are cited for their teachings regarding complexing or chelating agents in acidic plating solutions.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Monday-Thursday, 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Cleveland
Primary Examiner
Art Unit 1762

5/12/2005